
PINAL AIRPARK MASTER PLAN

Prepared for the
County of Pinal

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CHAPTER 4 FORECASTS

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The purpose of this chapter is to provide forecasts of aviation demand for Pinal Airpark at key intervals during the twenty-year planning horizon. The nature and levels of aviation activity have varied greatly from expectations in the 1970s. Airline deregulation, with the emerging importance of regional, commuter, and cargo carriers; the huge increases in fuel prices and liability costs, with the resultant depression of general aviation industries; and other economic factors have all contributed to the need for new aviation forecasts. These will serve as the basis for planning future facilities to accommodate the area's aviation needs through the year 2010.

Accurate forecasting in such a capital-intensive industry as aviation is essential. Nevertheless, forecasting any type of future activity remains more art than science. Regardless of methodology, assumptions must be made about how activities might change in the future. The objective of forecasting, therefore, is to provide a measure of those changes by which effects can be estimated and preparations made to accommodate the resulting conditions in a smooth and cost-effective manner. However, forecasts should be viewed only as guidelines.

FORECASTING ANALYSIS

FORECASTING APPROACH

The development of aviation forecasts proceeds through both analytical and judgmental processes. The first step in the forecasting process is the assessment of historical trends, requiring the collection of aviation-related data such as aircraft operations, fuel sale records, and based aircraft. Past trends in activity are normally examined to give an indication of what may be expected in the future. However, in the case of Pinal Airpark, there is extremely limited historical data to rely upon. As a result, the use of historical trends as a primary indicator of future activity does not provide a reasonable level of reliability.

The availability of historical data for an airport will affect the level and type of forecasting that can be conducted. For most general aviation airports, forecasting focuses primarily on aircraft operations and the number of based aircraft. Other specific items such as peaking characteristics may be defined from basic operations data. However, as is the case with many general aviation airports, detailed activity data for Pinal Airpark are not maintained.

With limited availability of actual data, it becomes necessary to rely on estimates from individuals familiar with the airport and on information from other sources. Data from larger segments of activity (county/state/national) may be evaluated to determine any correlation with local conditions. Socioeconomic indicators such as population and employ-

ment are also evaluated for their effect on aviation activity. The comparison of relationships between these indicators provides the initial step in the development of realistic forecasts of aviation demand.

Sound professional judgment is the final and most important part of forecasting. An experienced analyst examines the output of the foregoing steps and subjectively determines the preferred forecast. Among the intangibles to be considered are the use for which the forecast is being developed, the character of the community, the status and potential changes in the business and economic environment, pertinent advances in aviation technology, the impact of new facilities, and the policies and resources of the airport's sponsor or operator (Evergreen Air Center).

Even with the best analytical and judgmental techniques, however, a high level of confidence generally cannot be placed in forecasts extending beyond five years. Since airport development programs often require ten or more years to complete, it is therefore necessary to plan a capital improvements program with the flexibility to accommodate future activity levels which may vary from forecast levels. The development program must have provision for adjusting schedules to prevent overburdened facilities in the event of unanticipated growth or to avoid uneconomic, under-utilized facilities should activity fall short of that forecast.

Forecasting for Pinal Airpark was much more difficult than for the normal general aviation airport, and the Consultant relied more on the projected type of use of the airport than on any historical aviation activity. The Airpark has never had aviation activity typical of most Arizona airports. The long-standing lease agreement with Evergreen Air Center, Inc., creates an unusual historical activity which does not lend itself to typical forecasting.

SOCIOECONOMIC FORECASTS

Projections of local socioeconomic elements play an important role in developing aviation projections. Existing population forecasts for the local community and the County help to define the overall growth expectations for the area. Due to the location of Pinal Airpark being at the southern end of Pinal County, the Consultant felt it necessary to consider the socioeconomic elements of Pima County in the forecast effort. In actuality, the Airpark impacts Pima County more than Pinal County in the socioeconomic elements. Growth in aviation activity is related to a number of factors, including local activity trends. Local and County population projections are presented in Table 4-1.

Table 4-1
FORECAST POPULATION
Pinal Airpark Master Plan

<u>Year</u>	<u>State of Arizona</u>	<u>Percent Increase</u>	<u>Pinal County</u>	<u>Percent Increase</u>	<u>Pima County</u>	<u>Percent Increase</u>
1990	3,714,300	1.6	114,108	1.7	668,880	-1.2
1995	4,209,900	13.3	129,000	13.1	773,900	15.7
2000	4,800,700	14.0	145,800	13.0	877,100	13.3
2005	5,349,900	11.4	162,000	11.1	973,400	10.9
2010	5,940,300	11.0	179,800	11.0	1,075,200	10.5

Source: Arizona Department of Economic Security, Office of the Director, June 1989.

The most current population projections for Pinal and Pima Counties were developed by the Arizona Department of Economic Security in 1989. Although more current census data is available, the Department has not had the opportunity to update the forecasts and submit them to the counties for review. The data presented in Table 4-1 for the year 1990 represent current census figures. Based on the projections as shown above, the State of Arizona anticipates a growth in the state's population of approximately 2,226,000, in Pinal County's population of nearly 65,700, and in Pima County's of over 406,000 through the year 2010. All indications are that the State and Counties will continue to see sizable gains in population, although not at the rate of previous years. Healthy population growth trends should reflect a constant growth in the Arizona aviation marketplace and, more specifically, in Pinal and Pima Counties.

AVIATION DEMAND FORECASTS

Much of what could happen in the future is dependent on the long-term relationship between Pinal County and Evergreen Air Center. All tenants on the Airpark have subleases with Evergreen Air Center, and it is these agreements, along with the master airpark lease held by Evergreen, that will determine future levels and types of activities at the Airpark. The existing agreement with Evergreen Air Center runs through the year 2007. The County and Evergreen Air Center, Inc., are in the process of renegotiating the lease agreement that would give the company additional years to operate and to expand its facilities at the Airpark.

Several scenarios were studied to determine the future activity levels at Pinal Airpark. For most Arizona airports, the two possible activity categories would include (a) general aviation based aircraft and operations and (b) scheduled air carrier service. Another important consideration was the historical nature of Pinal Airpark activity. Each of these different operating scenarios could serve as the future for the Airpark. During this stage of the Master Plan study, an analysis of the different types of activities was completed to determine the future needs of Pinal Airpark. Once the future type of operation for the airpark was determined, a more realistic effort followed to determine the level of activities and the facilities that would be needed to meet the demand.

The following sections contain aviation forecasts for Pinal Airpark. These include aircraft operations, based aircraft, fleet mix, and peak demands. The results of the forecasting process provide input for the facility requirements analysis (documented in Chapter Five) as well as for all subsequent elements of this study.

AIR PASSENGER/CARGO SERVICE

The commercial service air trade area for Pinal Airpark includes the Tucson International Airport commercial air trade area and the City of Tucson. The major population and employment centers are located mostly south of the airport, with a very limited population or industrial base north of the Airpark. The population center of Tucson is approximately 25 miles and 30 minutes' surface travel time away from Pinal Airpark. For the foreseeable future, Tucson International will continue to serve passengers from the area surrounding Pinal Airpark.

The regional/commuter air carriers are filling a gap in the air transportation system by offering service to lower-density short-haul points, rural areas, and small communities that do not receive service from the larger national or major carriers. These smaller carriers (often called commuters) utilize small aircraft carrying from 6 to 50 passengers, offer frequent flights, and primarily provide connecting service to major airlines at airports such as Phoenix Sky Harbor and Tucson International.

The automobile and other modes of surface transportation offer the most significant competition, because most commuter airline routes in the U.S. are 125 miles or less. Due to the relatively high costs associated with commuter air travel as compared to surface transportation, the markets for such service are typically in areas not easily accessible by surface transportation or in densely populated areas where congestion makes peak-hour surface access costly and/or time consuming.

Pinal Airpark, its trade area, and its potential for airline-passenger/cargo generation are such that serious consideration for adding air carrier service is not a real possibility. Most airlines have not considered the Pinal Airpark market for service in past years. Since deregulation, airline passenger service has changed considerably. The continual expansion of airline passenger/cargo service at Phoenix and Tucson makes it unlikely that airline passenger or cargo service will ever be a reality in the Pinal Airpark area. The new Arizona regional airports study will soon be completed, and its end result could be the

beginning of a relocation of commercial aviation serving the Phoenix and Tucson areas. Both the Consultant and the staff of Pinal County deemed it prudent not to analyze further the potential for commercial air service as part of the forecasting section of this study.

GENERAL AVIATION ACTIVITY

General aviation encompasses all facets of aviation except commercial air carriers and military flying. Nationally, general aviation accounts for over 80 percent of all civil aircraft operations, but it accounts for only 33 percent of the takeoffs and landings at Pinal Airpark. Forecasts of general aviation activity at an airport would normally be used to plan for various airfield and landside facilities. Based aircraft, fleet mix, and aircraft operations are the primary forecast indicators for the types, sizes, and timing of facilities which will be needed to meet the demands of general aviation at an airport. However, Pinal Airpark is unique in that it has essentially no based general aviation aircraft.

A great many aircraft of varying sizes are stored on Airpark property, but few would qualify as general aviation aircraft. Many of the parked aircraft are older airline type aircraft. The area's warm, dry climate and location of Evergreen's maintenance operation at Pinal Airpark make the Airpark an ideal location to store these aircraft. While many of the stored aircraft will be cannibalized and destroyed, others will be sold and put into flyable condition. Forecasting this type of activity is very difficult and not desirable. It can be assumed that, if the hard surface land area on the airport remains available, it will continue to be filled with these types of aircraft. Storage and maintenance of these aircraft are not impacted by the economic base or activity of Pinal County.

In addition to the old airline aircraft, other types of aircraft are parked or stored at the Airpark as well, including Boeing 747s, 727s, 737s; Douglas DC-9s and DC-10s; and Lockheed L1011s. Most of these aircraft are either owned or controlled by Evergreen, and are normally at the Airpark for maintenance work. The aircraft that are not owned by Evergreen are there for similar maintenance or for storage until sold or put back into service by their owners. One of the primary reasons Pinal Airpark is so popular for the storage of these aircraft is the Evergreen maintenance facility. Once an aircraft is sold or required for service, Evergreen will put it into flying condition for delivery to another aviation facility.

At the present time, Sierra Pacific has a small fleet of older Convair 580 aircraft based at Pinal Airpark; these aircraft are used for leasing and charters. Unconfirmed reports state that these aircraft and company operations will be relocating to another area airport. Pinal Airpark is well suited for expansion of this type of operation, and it is anticipated that more companies of this type will consider using this facility in the future.

No general aviation aircraft owned by private individuals or companies other than those owned by Evergreen International are located on Pinal Airpark. The combination of the Army National Guard and Department of Defense training operations, and the requirement for tighter security make Pinal Airpark unattractive to the area's general aviation market.

Most private general aviation aircraft owners have chosen to base their aircraft at other more accessible facilities such as Avra Valley Airport, located only a few miles south of Pinal Airpark, or Eloy and Casa Grande airports, located to the north of the Airpark.

FORECASTING ANALYSIS

To project future aircraft activity at Pinal Airpark, it was first necessary to arrive at the type of market the Airpark would serve in the next twenty years. If the Airpark were to continue serving the present market, there would be no new private general aviation aircraft to provide for. The existing airport is leased to Evergreen Air Center, Inc., through the year 2007. Unless a new lease arrangement is worked out or Evergreen prematurely terminates the lease, little growth in private general aviation can be expected in the future. This scenario suggests that the development of new businesses or Airpark activities would be related to the Evergreen operation or be similar to the types of tenants presently using the Airpark.

Another scenario would involve cancellation or modification of the Evergreen lease and for the airport to open up to privately owned aircraft like those which presently use other small airports in the area. Facilitation of this change in aircraft mix at the Airpark would require a significant increase in new facilities that would be available to all potential general aviation users. Many of the existing tenants with non-aviation activities would have to consider what effect this would have upon their facilities and operations. One of the real questions is, as an open airport, whether the facility would attract the smaller general aviation aircraft owners. Other airports, such as Avra Valley, cater to the general aviation aircraft owner and are located closer to the major source of users in the Tucson area. The Army helicopter training activity and the high-altitude parachute-jumping activity by the DOD training operation do not make flying in and out of Pinal Airpark attractive to most pilots. It is also possible that an additional general aviation training operation at the Airpark could cause a negative impact on the existing military and civilian training operations.

The third scenario would be to plan the Airpark around the renegotiation of the Evergreen lease to allow the County of Pinal to assume the role of Airpark operator, with Evergreen Air Center being a major tenant. In this situation, the County would be responsible for the Airpark's operation and lease development. The Airpark would be opened up to additional users looking for this type of controlled atmosphere. Most of the existing tenants—such as Evergreen, DOD, Army National Guard, US Forest Service, and Federal Law Enforcement Training Center—prefer the secure atmosphere of Pinal Airpark. Many have stated that this is the reason that they chose the Airpark for their unique type of operation. Many of the training activities conducted from the Airpark are not compatible with open public facilities.

RECOMMENDATION

After careful review and consultation with Pinal County staff, Evergreen Air Center personnel, Airpark tenants, and the Planning Advisory Committee, it was determined that the Airpark should continue to operate as a public facility that has a high level of control over user and public access. This does not in any way imply that Pinal Airpark is not open to the public, it just means that the facility will remain highly secured. Public access to active airfield or lease areas will be limited to those who have business at the Airpark. It is strongly believed that a unique market exists for Pinal Airpark. The types of activities which are now present at the Airpark and projected to remain there for many years would be incompatible with most airport operations.

The agreement with Evergreen Air Center has approximately sixteen years remaining, and there is no indication at the present time that the company will not be there at the end of the term. Pinal County is presently discussing the terms of the agreement with Evergreen, but all indications are that the company wants to complete the term or extend the lease without giving up control of the entire facility. Whether or not the lease is modified and the County assumes a greater role in the Airpark operation, the fact remains that the Airpark operation, as it exists today, is not compatible with most general aviation activity. The absence of an air traffic control tower and the diversity of aviation activity makes public use of this airport more difficult and at times unsafe.

The Department of Defense plans to acquire an area on the western side of the Airpark from the County to accommodate their future operations. Though a large share of the Arizona Army National Guard training operations will be relocated to another site, a good percentage of their operation will remain at Pinal Airpark.

It was determined that, instead of projecting the number of based aircraft, operations, etc., which is normally part of an airport master plan, this study would determine the type of users the airport would have and then maximize the use of the County-owned property. This plan assumes that the Evergreen lease will continue until at least its current expiration date in the year 2007. The use of the Airpark will remain relatively consistent with the uses developed in the past by Evergreen Air Center. It is the conclusion of the Consultant, County, and Planning Advisory Committee that the greatest return for the County and adjacent communities will be realized by continuing with this operating scenario.

BASED AIRCRAFT

The numbers of based aircraft on any airport are dependent on factors such as the availability of aircraft storage facilities and services; the number of airports in the immediate vicinity; aircraft ownership trends in the area and state; and in the case of Pinal Airpark, whether the airport is attractive to aircraft owners and pilots. Earlier in this chapter, it was

concluded that, compared to other area airports, Pinal Airpark will not be an attractive facility for locally owned general aviation aircraft. It appears that the existing and projected Airpark activity is not conducive to a higher level of general aviation activity than exists at the present time. The study's projection of based aircraft will be based on the type of activity presently at the Airpark. No expansion of traditional general aviation storage facilities is anticipated.

According to a spokesman for Evergreen Air Center, one of the significant reasons that Pinal Airpark is attractive for the storage of the older commercial aircraft is its many acres of paved surfaces. Most of the areas where the aircraft are stored are closed taxiways and runways. Although the pavement is in poor condition, it is quite serviceable for parking aircraft for long periods of time. The revenue derived from storing aircraft would not be adequate if newly constructed facilities were used. Therefore, it must be assumed that, as long as the older hard-surface facilities are available, aircraft will be stored at the Airpark. The facility requirements analysis must assume that the existing paved surfaces will be projected to be filled with aircraft and that no new pavement shall be constructed just for the purpose of long-term storage of older aircraft. Table 4-2 determines the projected based aircraft through the twenty-year planning period.

Table 4-2
BASED AIRCRAFT
Pinal Airpark Master Plan

<u>Aircraft Types</u>	<u>1990</u>	<u>2010</u>
Single-Engine	5	10
Multi-Engine	28	35
Jet	34	100
Helicopter-Civilian	3	10
Helicopter-Military	<u>55</u>	<u>65</u>
Total Based Aircraft	125	220

AVIATION OPERATIONS

Aircraft operations at an airport are categorized as either local or itinerant. A local operation is a takeoff or landing by an aircraft in the traffic pattern or within sight of the air traffic control tower, by aircraft known to be arriving or departing from flight in local practice areas, or by aircraft executing practice instrument approaches at the airport. Itinerant operations are all operations other than local operations.

As indicated earlier, it is difficult to estimate historical aircraft operations at a general aviation airport, let alone project future activity. Generally, airport planners use ratios of aircraft operations per based aircraft as a technique to make the mathematical manipulations easier. This does not imply that each based aircraft made that many landings and takeoffs in a year—it is simply a ratio of the total operations to total based aircraft.

Aviation operations figures have varied over the years at Pinal Airpark, due to the method of estimating. Operations data is recorded on the FAA Airport Master Record Form, FAA Form 5010-1 or FAA Form 29A. This form is used to record operations as logged by the Air Traffic Control Tower (ATCT); in the absence of an ATCT, the operations are estimated by collaboration among FAA, airport management, and FBO personnel. Experience has shown that, when estimates by airport officials are required, the accuracy tends to diminish. Periodic counting of actual operations should be performed, when possible, to validate the estimates.

Typically, the best predictor of aircraft operations occurs when the number of operations is closely tied to the number of based aircraft. However, Pinal Airpark is considerably different than most airports in the area, state, or country. Eighty percent of the Airpark's operations are performed by military helicopters from the Army National Guard Base. If the standard method for estimating operations tied to based aircraft is used, the result is an estimated 880 operations per based aircraft for the year 1990.

Airpark operations for 1988, according to the FAA's 5010 reports, total 3,951—far short of the approximate 149,513 operations estimate determined by the Army National Guard and Evergreen Air Center. The Consultant's experience tells us that the estimated operations in the 5010s was a continuation of years' past estimates and that the FAA, when filling out the following year's form, did not request up-to-date information. 5010s frequently reflect the same estimated operations figures for several years. For this reason, the FAA's 5010 figures were not used in estimating the airport's future operations.

The historical and projected operations for Pinal Airpark are shown in Table 4-3 and reflect the current activity estimates agreed to by the Army National Guard and Evergreen Air Center staff. Estimates of future operations are based upon their sound judgment and the Consultant's experience. At Pinal Airpark, military operations exceed 80 percent of the total for any given year. As shown in Table 4-3, the estimated operations are not projected to continue at the same level, due to the development of the training facility at Picacho Peak Airfield, north of Pinal Airpark. The Western ARNG Aviation Training Site emergency training flight operations will be relocated to the Picacho Peak facility. This transition is anticipated to take place in the Fall of 1993.

All aircraft operations associated with the Evergreen Air Center are anticipated to increase on an annual basis. The current 600 annual operations attributable to the Evergreen activity is anticipated to increase by approximately 2 percent per year. Much of the projected increase is based upon the expansion plans of the company. If development of

the new hangar does not take place, the business activity cannot grow and the future aircraft operations should remain at the 1990 level. Previous estimates of 10,000 annual operations included general aviation activity serviced by Evergreen. These numbers are now included in the general aviation category.

Table 4-3
FORECASTS OF AIRCRAFT OPERATIONS
Pinal Airpark Master Plan

<u>Year</u>	<u>Itinerant</u>	<u>Local</u>	<u>Total</u>
Historical			
1990	93,500	81,000	174,500
1991	46,400	81,700	128,100
Projections			
1995	28,700	9,100	37,800
2000	33,400	10,600	44,200
2005	39,700	12,500	52,200
2010	47,800	14,400	62,200

B & F Enterprises, which has operated a parachute-jump training facility at the Airpark, accounted for over 47,000 of the total Airpark operations. This training operation recently relocated to Avra Valley Airport; therefore, no future operations have been projected for this company at Pinal Airpark. General aviation operations accounted for roughly 10,650 estimated operations. The Department of Defense estimates approximately 6,250 annual operations at Pinal related to their facilities. Several factors led the Consultant and Evergreen Air Center to anticipate a substantial increase in this area. A new auto race track is projected to be constructed within the next few years within a few miles of the Airpark. Air Center staff believe that race track participants and visitors will choose to fly into Pinal Airpark due to its close proximity to the track. Evergreen Air Center is also making a greater effort to attract the general aviation market to the Airpark, offering a full range of services for the general aviation pilot. As the military reduces their training operation at the Airpark, more private aviators may choose to use the Airpark rather than avoid it, as has often been the case in the past.

As noted earlier, the Airpark experienced a sharp decline in activity between 1990 and 1991, due to the relocation of some general aviation operators to other airports. The current level of activity is believed to represent typical operational conditions at the Airpark. However, as noted earlier, the planned development of military training facilities for helicopters will reduce Airpark operations below current levels by 1993 or 1994.

PEAKING CHARACTERISTICS

Like many other public facilities, various components of airports must be designed to meet demands during periods of high activity levels. Typical measures of peak activity include peak month, busy-day, and design hour. Peaking characteristics of aircraft operations are used to evaluate and project airfield facility requirements. At Pinal Airpark, in excess of 60 percent of the 1990 operations were by Army National Guard helicopters. Of these 110,000 operations, only 11,000 (or 10 percent) are flown to and from the Airpark's runway. The balance of the 110,000 military training operations are flown from the helicopter landing pads located adjacent to the ANG Base facility. The peak month is reported to be November, and the majority of the activity is military training. The peak month accounts for approximately 12,000 to 14,000 operations by ANG helicopters. The peak day's operation amounts to roughly 630 operations, while the peak hourly operations are under 125. The balance of the Airpark's operations are evenly spread throughout the year, causing no impacts or delays to based or transient aircraft using the facilities. It has been determined that it is not necessary to project the peaking operations at the Airpark, because at the present time, there are no capacity problems. Also, when the Picacho Peak facility is ready for use, total traffic at Pinal Airpark will decrease, making peak operational periods less important.

ANNUAL INSTRUMENT APPROACHES

Forecast annual instrument approaches (AIAs) provide indicators for an airport's navigational aid facility needs. The FAA defines an instrument approach as "an approach to an airport, with intent to land, by an aircraft in accordance with an Instrument Flight Rule (IFR) flight plan, when the ceiling visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude."

Pinal Airpark does not have a precision or nonprecision approach. The Airpark experiences instrument meteorological conditions approximately 0.1 percent of the time. With the low number of operations and excellent weather, it is unlikely that the Airpark will qualify for an instrument approach during the planning period. It is possible that a nonprecision approach could be achieved at the Airpark if traffic were to build substantially beyond what is projected during the planning period. If the Airpark is to acquire an instrument approach, it will be supported by factors such as safety or private requirements rather than on weather conditions.

FORECAST SUMMARY

The forecasts provided in this chapter form the basis for subsequent tasks in this master planning study, including the environmental analysis, facility requirements, analysis of alternatives and financial analyses. The following chapter determines the airport's existing component capacities and the facility improvements which will be needed to meet the future demands that have been forecast in this chapter.